AN EXPERIMENTAL DESIGN FOR TESTING EFFICIENCY OF PLOT SIZE AND SHAPE IN SAMPLING PONDEROSA PINE LOSS AT BLACKS MOUNTAIN

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In lieu of the Forest Insect Laboratory acting as a single agency to be responsible for all phases of the annual forest insect survey program in California, cooperation is being solicited from private land owners as well as other state and federal land-managing agencies to strengthen the survey activities. In addition to the responsibility of cooperating agencies and individuals for the detection phases of the annual survey, statistical information should be provided by them to determine the trend of infestations, and in part, the gross loss caused by insects for each subregion of the state.

In order to establish a plot sampling system which will fit into a pattern of cooperative effort, it is necessary to determine the most efficient size and shape of plot to yield maximum information. Past studies have shown that plots of 20 acres in size are more efficient in sampling loss trends and gross loss than plots of larger size[1]. It is highly probable that plots smaller than 20 acres may be better suited for sampling loss in ponderosa pine, but basic data to determine this point are not available from records of past surveys. It is proposed, therefore, to determine the efficiency of plot size and plot shape in conjunction with the current annual inventory of loss on 1,200 acres of virgin lands at Blacks Mountain during the current spring months.

The various sizes and shapes of plots suggested for this study are illustrated in Figure 1. Additional work in the inventory of loss in this proposed study would be required only for the 1/2-and 1/5-acre plots to be run at the completion of the regular cruise. The additional work is estimated at two crew days. Following is the procedure planned for this study:

1. A conventional inventory of loss will be made for the virgin areas, and exact location of infested trees will be plotted on a map of each compartment (see Figure 2).

2. A four-man crew will be needed for the cruise, with specific duties of each man as follows:

(a) Two spotters locating and marking infested trees on a four-chain strip on both sides of a two-chain center line.

(b) One spotter locating and marking infested trees on a two-chain center line strip.

(c) A compassman to plot accurately the location of each infested tree.

1/ Hall, R. C. Sampling methods in forest insect loss surveys in northeastern Calif. Station Report. Berkeley, Calif. 2/20/42.

The spotter responsible for the 2-chain center strip will also record loss on the 1/5- and 1/2-acre circular plots beginning at 2-1/2 chains from the initial point of cruise and at 5-chain intervals thereafter.

3. Subsequent to the inventory of loss on the compartments, each man will cruise 1/2-and 1/5-acre plots at 4-chain intervals on lines between the previous cruise strips.

4. Loss for the past 10 years (now marked at Blacks Mountain) will be taken on all circular and line plots. Current loss will be recorded separately.

5. The various sizes and shapes of sample plots possible for study in the above experiment is shown in Table 2.

Suggested assignment: Hall, Parnias, Bongberg and either Struble, Keen, Miller, or Callaham.

Suggested schedule: May 20-26, 1951

TABLE 1

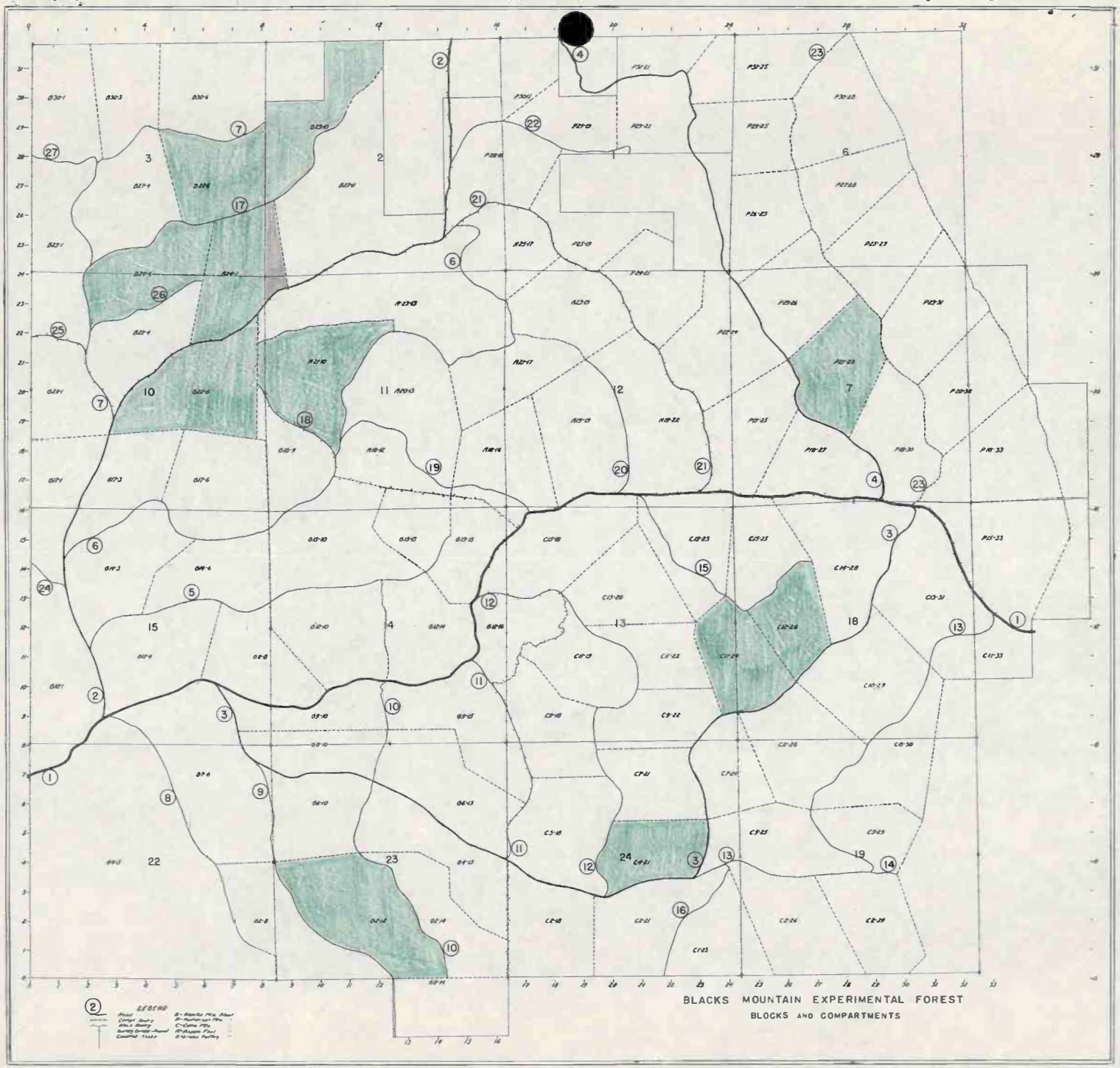
VIRGIN COMPARTMENTS TO BE CRUISED

Compartments	Virgin Acres	Number of Circular Plots for 10% Cruise 1/5-acre	1/2-acre
B-27-6	73.2	37	15
B-24-4	91.2	46	18
B-24-7	101.3	51	20
B-29-10	96.3	48	19
G-20-6	125.1	63	25
A-21-10	64.7	32	13
G-2-12	143.1	72	29
C-4-21	72.0	36	14
C-11-24	82.4	41	16
C-12-26	63.8	32	13
P-21-28	99.9	50	20
P-27-28	77.2	39	15
P-30-28	80.9	40	17
TOTAL	1,171.1	587	234

TABLE 2

SIZE AND SHAPE OF SAMPLE PLOTS

Size in Acres	Shape	Dimensions
1/5	Circular	52.7 ft. in radius
1/2	"	83.2 ft. in radius
1/2	Rectangular	1 x 5 chains
1	"	1 x 10 chains
1	"	2 x 5 chains
2	"	1 x 20 chains
2	"	2 x 10 chains
2-1/2	Square	5 x 5 chains
2-1/2	Rectangular	2 x 12.5 chains
2-1/2	"	1 x 25 chains
5	"	5 x 10 chains
5	"	1 x 50 chains
5	"	2 x 25 chains
10	Square	10 x 10 chains
20	Rectangular	10 x 20 chains
20	"	5 x 40 chains


BLACKS MOUNTAIN EXPERIMENTAL FOREST
BLOCKS AND COMPARTMENTS

A = 100% CRUISE 10 CH. STRIP
A1-4 = 1/4 2½ ACRE PLOT 5 x 5 CH.
B = 1 CHAIN STRIP 20% CRUISE 10 CH. APART
C = 1 CHAIN STRIP 10% CRUISE " "
D = CIRCULAR ½-ACRE PLOT 10% CRUISE
10 CH. APART AT 5 CH. INTERVAL
E = CIRCULAR ⅕ ACRE PLOT 10% CRUISE
5 CH. APART AT 4 CH. INTERVAL

SIZE OF PLOTS - POSSIBLE

ACRES	
1/5	CIRCULAR
1/10	"
1/2	1 x 5 CH.
1	1 x 10 CH.
1	2 x 5 CH.
2	1 x 20 CH.
2	2 x 10 CH.
2-1/2	5 x 5 CH.
2-1/2	2 x 12.5 CH.
2-1/2	1 x 25 CH.
5	5 x 10 CH.
5	1 x 50 CH.
5	2 x 25 CH.
10	10 x 10 CH.
20	10 x 20 CH.

FIGURE 1